

The Mining Journal

LONDON, JUNE 19, 1959

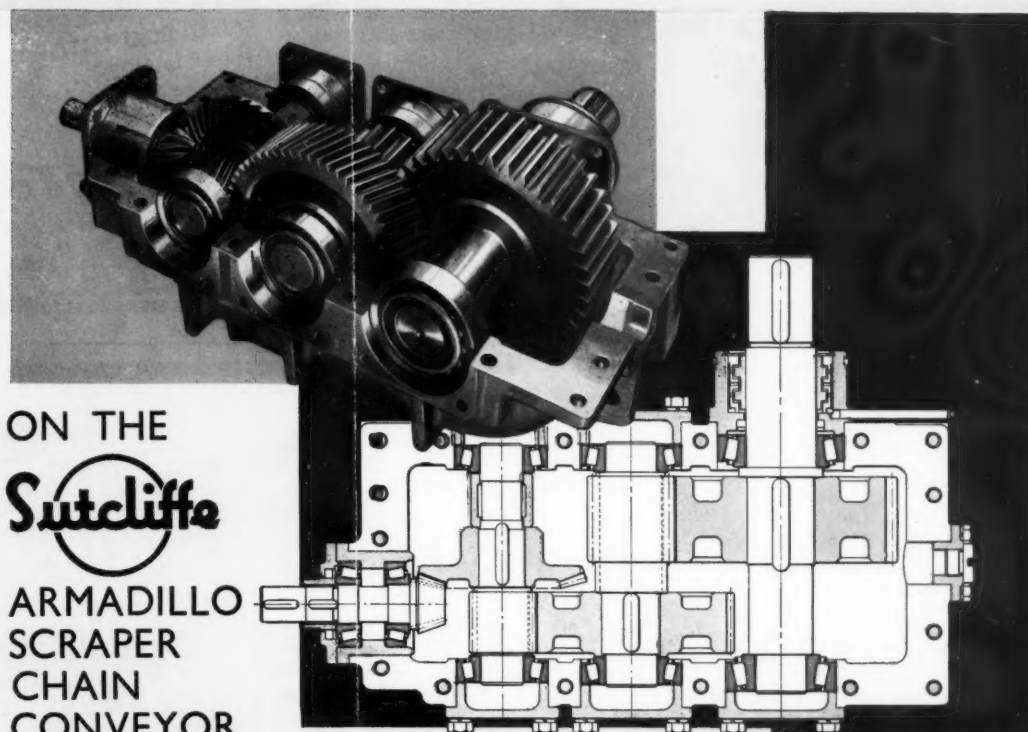
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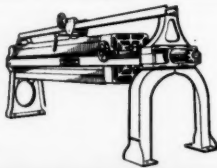
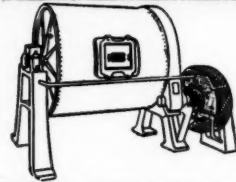
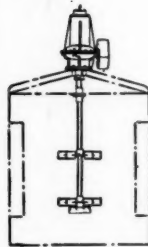
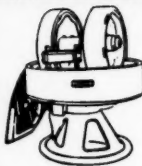
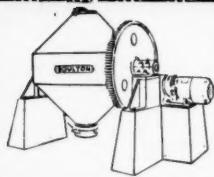
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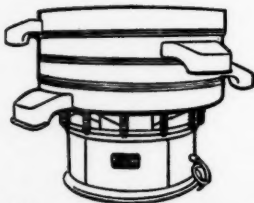


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The Mining Journal

London, June 19, 1959

In this issue . . .

Bread on the International Waters . . .	669
Geological Research in Northern Rhodesia . . .	670
Indian Mineral Production . . .	670
As Best We Can . . .	670
Electrolytic Pre-treatment of Metals for Metallographic Examination . . .	671
Turkey's Mining Industry . . .	673
Mining Miscellany . . .	675
Machinery and Equipment . . .	676
Metals and Minerals . . .	677
London Metal and Ore Prices . . .	678
Mining Finance . . .	679
Rand and Orange Free State Returns for May . . .	680
A.M.E.M.E. Convention . . .	680
Company Meetings and Announcements . . .	681

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Bread on the International Waters

LAST year the United States gave and loaned to foreign countries another \$5,100,000,000, spread among some seventy countries, bringing to \$72,000,000,000 the total amount Uncle Sam has made available to other nations since the end of World War II. Geographically, the largest slice of America's last year's aid cake went to the Far East and Pacific countries, which received \$1,700,000,000. Near Eastern, African and South Asian countries ranging from Greece to India received \$1,500,000,000.

This year President Eisenhower has asked Congress for \$3,900,000,000 for foreign aid. The actual bill contains provisions that would give the President authority to transfer up to 30 per cent of military aid funds to economic programmes. It thus represents an important switch in Congressional sentiment towards an economic type of aid rather than military assistance. It is also noteworthy that the House Foreign Affairs Committee, while voting to reduce the Administration's proposals for military assistance and defence support money, voted to increase to \$800,000,000 the Administration's \$700,000,000 petition for the Development Loan Fund, which is used to support long-range growth in the world's less developed regions.

But the United States is by no means the only rich uncle to whom the under-developed nations can turn for loans and grants. On the other side of the Iron Curtain is a rival philanthropist from whom financial assistance is sometimes forthcoming on the easiest of terms. The U.S. State Department estimates that between 1954 and the beginning of 1959, Soviet *bloc* credits and grants promised to economically under-developed countries amounted to \$2,400,000,000. A modest total in comparison with Uncle Sam's \$5,000,000,000 a year, but no mean contribution to the ever-rising tide of foreign aid and, of course, the current rate of Russian aid must be substantially above the average for the past five years. Moreover, Russian long-term credits are granted at a low rate of interest—usually 2½ per cent.

So far as the under-developed nations are concerned, this form of economic warfare has the quasi-magic qualities of a tale from the Arabian Nights, with America and Russia in the role of beneficent genies. Germany and Japan, too, are only too ready to supply machinery and technical know-how on the "never-never" plan, and other industrial nations are rapidly following suit.

All this flow of capital into the economically backward regions must result in a rapidly expanding demand for plant and equipment for engineering projects and for the extraction and processing of minerals. Bread is being cast on the waters on a truly global scale and it will return after not so many days. While there can be no question as to the existence of what has come to be termed "economic warfare" between the two rival *blocs*, it is no less indisputable that in American terminology "foreign aid" covers a multitude of activities that could equally well be classified under the heading of "trade aid".

These renewed reminders that the United States and Russia—not to mention all the other industrial countries—are vying with

one another to supply financial and technical assistance for development projects throughout the world, serve to underline the urgent need for a vigorous and concerted minerals policy in the United Kingdom if our traditional position in the mining machinery markets is to be maintained.

Whether loans and grants to the less developed countries are with or without strings, they are usually accompanied by arrangements for technical assistance. They may also take the form of "package deals" which ensure that the consequential orders for capital equipment will come to the country which provided the finance.

There is also a growing realization on the part of most industrial countries that, just as trade once followed the flag, so it now follows the consulting geologist and mining engineer. Having regard to the long time lag between the initial survey of a new mineralized area and the placing of orders for plant and machinery, it is apparent that from the work now being done by the mining consultant in exploring and opening up new mineral deposits in little developed regions will come opportunities for the mining machinery manufacturer perhaps five or ten years hence.

This appears to be clearly appreciated by almost every country but our own, for the independent British consultant is virtually alone in having to operate on an unsubsidized basis. If the geologist and the mining engineer are indeed the spearhead of the export drive, can we afford to blunt their striking power by leaving them to compete unaided with foreign consultants who are able by devious means to quote a subsidized fee whenever this is regarded as politically expedient?

GEOLOGICAL RESEARCH IN NORTHERN RHODESIA

During 1958, work was concentrated in three main directions, states the annual report of the Northern Rhodesia Department of Geological Survey for 1958. These were: continuation of the regional mapping programme; laboratory work on analyses for niobium in soil samples from the Feira carbonatites, and other chemical determinations; bringing to the publication stage those maps on which the fieldwork had already been completed.

Field teams carrying out regional mapping operated on a much reduced scale owing to the fact that the number of geologists available reached a very low level. Nevertheless, during 1958 some 2,150 square miles were covered by regional geological survey. The geological staff is again increasing, and the position in regard to recruitment is probably better than it has been since the end of World War II.

Research activity reached a new peak of intensity, with three separate teams, one of them German, operating on various problems.

A brief further investigation was made of the small deposit of blue asbestos $4\frac{1}{2}$ miles south-west of Lusaka, first recorded in the annual report for 1957. It is considered unlikely that the asbestos mineralization will prove to have any economic significance.

An extensive occurrence of graphite-gneiss occurring midway between Sasare mine and the former site of the District Office of Petauke was mapped and sampled. The graphite occurs as disseminated coarse flakes in a weathered granitic gneiss. The orebody extends for at least two miles along the valley of the Mkonda River and is 200 to 300 yds. wide. It is weathered to a depth greater than 10 ft. Thirty samples gave an average graphite content of 6.8 per cent, the maximum being 12.6 per cent. Samples of the ore are being submitted to the Government

Metallurgical Laboratory at Salisbury for comprehensive metallurgical tests.

A single specimen of rock forwarded for determination by the District Commissioner, Mporokoso, proved to consist almost entirely of barytes. The District Commissioner reported that the rock was found in large quantities around Lushinga. It was patchily dark and light grey, however, and therefore of little use for many of the industrial purposes for which a white baryte is essential. The mineral took a high polish very well and, being soft, proved easy to work and to shape. Provided the deposit proves sufficiently extensive, there is believed to be a possibility of creating a small local industry in the carving and polishing of ornaments, utensils, and ashtrays, etc. from this material much in the way that the ornamental serpentines are treated in Cornwall.

The analyses of soil samples from the Feira carbonatites were completed and a technical report on these occurrences was compiled.

A detailed scintillometer survey was carried out in the Gwembe Valley, primarily to find out if there was any radioactivity connected with the extensive Karroo and post-Karroo faulting. No radioactivity was found directly connected with the faults, but twelve small anomalies were recorded, almost exclusively in the lower beds of the Escarpment Grit. Two samples from the vicinity of Bunga Hill were assayed by the Atomic Energy Division of the Geological Survey of Great Britain, and gave quite encouraging results, of 0.13 and 0.05 per cent eU_3O_8 . A chemical assay to determine the relative proportions of uranium and thorium has not yet been carried out, but since it seems likely that the greater proportion may be U_3O_8 , this discovery could be of economic interest.

INDIAN MINERAL PRODUCTION

Provisional estimates made by the Indian Bureau of Mines place the total value of the 1958 Indian mineral production (excluding petroleum and minerals prescribed under the Atomic Energy Act, 1948) at 1,310,000,000 Rs. compared with 1,273,000,000 Rs. in 1957. The increase of 37,000,000 Rs. was mainly due to higher production of coal, salt, iron ore, mica, limestone, and ilmenite, in the year under review. Coal, with an output of about 46,100,000 tonnes, was the leading commodity, and was valued at 866,000,000 Rs.

The production of other minerals was: copper ore, 411,000 tonnes; gold, 5,288 kg.; ilmenite, 314,000 tonnes; iron ore, 6,000,000 tonnes; limestone, 10,300,000 tonnes; manganese ore, 1,200,000 tonnes; mica (crude), 31,802 tonnes; and salt, 4,200,000 tonnes.

The overall position is indicated by the quantity index of mineral production, which stood at 125.5 in 1958 (base, 1951 : 100) compared with 123.6 in 1957.

AS BEST WE CAN

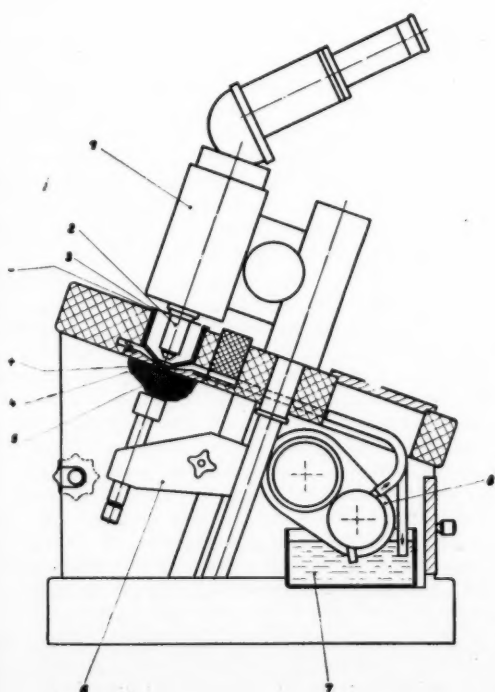
Owing to a dispute in the printing industry, *The Mining Journal*, in common with the rest of the periodical press in Britain, is faced with an extremely difficult situation in the weeks immediately ahead. In these unpredictable circumstances, we can only endeavour to continue publishing as best we can. While every effort will be made to keep our news and commentary as comprehensive and up to date as possible, some reduction in size appears unavoidable until normal conditions in the printing industry are restored.

Electrolytic Pre-treatment of Metals for Metallographic Examination

WITHIN the framework of its applications, electrolytic polishing has a number of advantages compared with the mechanical polishing of metal specimens. Thus a metal section can be polished in a considerably shorter time than would be possible by mechanical polishing. With electrolytic polishing, unlike mechanical polishing, the structure of the metal does not become smeared with a shattered surface layer. Structural etching can be carried out on electrolytically polished specimens in the same working process as the polishing in an incomparably shorter time, as the shattered surface layer need not be previously removed.

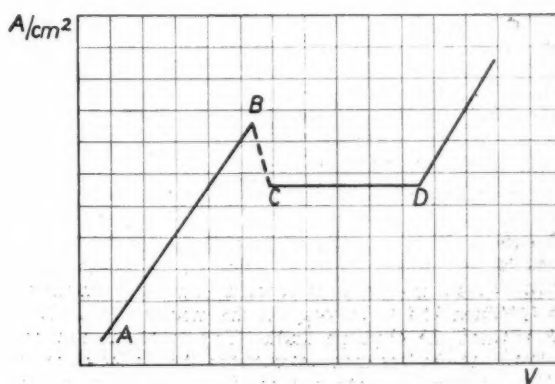
These advantages stem from the fundamentally different levelling mechanism in electrolytic polishing. This is based on the principle that the surface of the metal section is dissolved by the action of an electric current in an electrolyte. This dissolution has to be effected, of course, in a certain manner. Usually the speed of dissolution on dissolving a substance is greater on the surface of any elevations than in depressions. On the other hand, various materials dissolve at a different speed under otherwise equal conditions.

The same applies to the various crystal faces of the same substances. In the case of poly-crystalline metal specimens, all the various speeds of dissolution are superimposed, with the result that the dissolving process does not result in any definite levelling or any etched metal surfaces which would be of use for microscopic investigation. When dissolving a metal in an electrolytic circuit, it is, however, possible to render ineffective the various dissolving speeds conditioned by the structure or the profile of the surface by using a suitable electrolyte and selecting the appropriate electrical conditions. In this manner it is, therefore, possible to produce either a polished surface or—in the case of an already polished surface—an etched surface which can be used for microscopic investigation.



Examination

In addition to mechanical polishing, electrolytic polishing is applied to an ever-increasing extent as a method of preparation in metal microscopy. Such an application of electrolytic polishing was described for the first time by "Jaquet" in 1932 with copper as the example, at the same time drawing attention to the possibility of a subsequent etching of the structure in one and the same working process. In the meantime, a number of publications have been made according to which this method is applicable to all metals of technical interest and to a great number of alloys. Electrolytic polishing has been used by Barringer some years ago at the Imperial College (I.M.M. Trans. C. 1954-55) to a limited extent in order to reveal details of texture in pyrite which were not otherwise apparent.



Although the polishing and etching effects can be produced within a wide range of electrical conditions, the quality of the polished or etched surface depends, nevertheless, to a great extent on the applied terminal voltage and current density. The electrical conditions required for a particular quality of surface are in their turn determined by a number of factors. Such factors are, amongst others, the type and condition of the specimen to be treated and the composition of the electrolyte.

Other factors are the resistances in the complete circuit, as well as the size, shape, and position of the electrodes. Also the movement of the electrolyte exercises a decisive effect in this respect. At times the influence of the various factors can only be comprehended with difficulty or not at all, so that the prevailing conditions can hardly be made reproducible.

Even with simple instruments such as the example depicted it is, therefore, only possible, after a thorough study

Alongside, at left, a schematic diagram of V. E. B. Carl Zeiss electrolytic polishing instrument, showing (1) Epignost microscope for top illumination, (2) objective, (3) cathode, (4) cathode window, (5) metal specimen, (6) specimen support, (7) container with electrolyte, and (8) pump with motor. Above, in centre of page, a schematic graph of the current density-voltage curve, showing etching range (AB) and polishing range (CD)

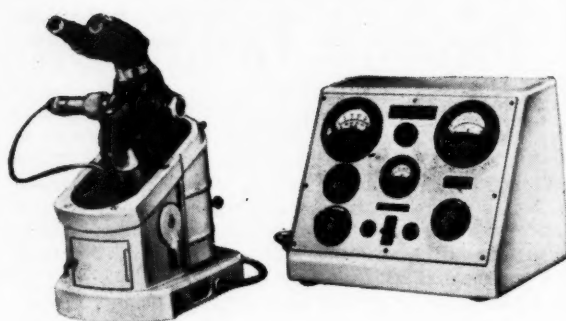
At right, alongside, the electrolytic polishing equipment of V. E. B. Carl Zeiss, Jena. Below, in centre of page, arrangements of instruments for electrolytic polishing

of electrolytic polishing and etching to obtain useful polished or etched metal specimens. Some instruments on the market have, therefore, been developed with a view to keeping a number of the decisive factors constant by means of suitable control equipment; for instance, the size of the surface to be treated and of the cathode, as well as the shape and position of the electrodes. Certain measures were adopted also with regard to the movement of the electrolyte. In this way experienced laboratory assistants can usually prepare specimens which are suitable for routine investigation of the metal structure when the following conditions are defined: the electrical data for the instrument, the period of processing for the given specimen, the amount of preliminary grinding carried out, and the electrolyte.

Recently, VEB Carl Zeiss, Jena, have developed an instrument combined with a direct illumination microscope in such a way that the surface of the specimen can continuously be observed and even photographed in the course of the treatment of the metal specimen. The advantages of such a design are obvious. By means of this instrument the specimen can be judged by the metallographer in a single working process whilst polishing and etching are carried out, without having to subject the specimen to an intermediate treatment for the purpose of microscopic investigation. In the majority of series investigations in material testing, this may mean a great saving in time which should not be underestimated.

By microscopic observation during the treatment of the specimen it is immediately possible to appreciate the influence of the given electrical data, the processing period, speed of flow of the electrolyte, etc., on the surface condition. Thus it is possible to proceed with the treatment of the specimen and to interrupt it the moment the surface has attained the requisite finish. This is of importance, especially as the treatment instructions for the instruments hitherto known have not, and could not, always take into consideration all the factors affecting the quality of the surface. As all the instructions represent, therefore, only approximate values, it is left to chance to produce an optimum quality of surface even when strictly adhering to all the instructions. If an optimum surface quality is aimed at, it would, with the working methods so far applied, be required to subject the specimen to several treatments until the required surface consistency was ascertained after inserting the microscopic specimen again and again.

These specimens which have to be inserted time and again become very time-wasting when the treatment conditions have to be ascertained only by a test series, because



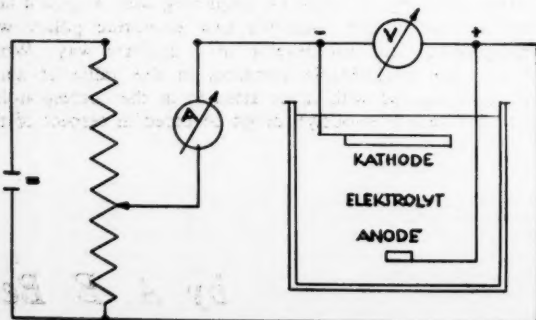
they are not yet determined for the instrument in question and for the metal specimen to be investigated. If metal specimens are greatly damaged by the treatment of the specimen prior to polishing, and if changes in the surface areas occurred, it will be possible by means of microscopic observation in the course of the treatment of the specimen quickly and certainly to determine when the structure consistency does not change any longer, thus revealing to observation the actual structure of the metal specimen. With the methods hitherto available many time-wasting microscopic tests had to be interspersed in such instances.

The design of the electrolytic polishing instrument described can be seen from the illustration. The metal specimen is pressed from below against the non-conducting diaphragm with a circular aperture (6 mm. dia.). The specimen is observed from above through the electrolyte. The objective is protected by a cover serving at the same time as cathode, the lower opening of which is closed by a plan-parallel glass plate. The shape of the cathode in conjunction with the correspondingly shaped diaphragm ensures that a laminary flow of the electrolyte is produced over the metal specimen as is required for any good polishing effect.

This shaping also results in the treated specimen assuming under the influence of the existing electric field a condition which is as uniform as possible all over. The spare electrolyte is in a container at the back of the instrument. By means of a pump, the electrolyte is made to circulate with an adjustable speed of flow through the electrolytic cell. Observation of the metal surface can be carried out up to a magnification of 200 in a bright field and also by polarized light. This microscope being the standard direct illumination microscope, the Epignost, can at any time be used together with a stand for other microscopic azimuthal observations. Microphotographs of the metal surface can be made during observation by connecting the attachment camera, Miflex.

A separate power pack (220 volt a.c.) supplies the instrument with current. This unit permits the selection of direct current in the electrolytic cell continuously within the ranges 0-15 and 0-60 volt. The transformer, rectifier, and device for smoothing the rectified current of the instrument are provided for up to 1 amp., which would make it possible to work with anodic current densities up to approximately 400 amp./sq. decimetre. The electrical data at any given moment can be read on a voltmeter set for the ranges 0-15 volt and 0-60 volt, and on an ammeter with the ranges 0-0.1 amp., 0-0.5 amp., and 0-1 amp. The power pack also supplies the pump motor with the required direct current. The voltage applied to the motor can be adjusted as required from 0-24 volt. It can be read on a voltmeter.

A number of other devices permit of safe and certain use of the instrument. Thus the mounting for the specimens is designed in such a manner that any shape up to



100 mm. dia. and 30 mm. high can be fixed. With smaller diameters of, say, 20 mm., specimens of up to 100 mm. long can be attached. Regarding the shape of the specimen, it is only required to have at least one circular plane area of approximately 8 mm. dia. The head of the mounting is provided with springs which permit the removal of the specimen without loosening the setscrews, or if another part of the surface of the specimen is to be treated, to shift it accordingly. By closing the space occupied by the specimen with a two-winged door, it is made impossible to touch the live anode as the circuit is interrupted when the door is opened. The cathode, which is accessible, is earthed.

In addition, a switch at the foot of the instrument is provided for the immediate interruption of the circuit of the electrolytic cell. A push-button switch in easy reach of this switch makes it possible to switch on the current for a short time, which may be very handy for obtaining a certain degree of etching at any set voltage at the terminals. Close to this switch is positioned the switch for the circuit of the pump motor. A tap in the cover plate of the instrument enables the draining speed of the electrolyte from the electrolytic cell to be adjusted.

When placing the microscope in a high position, the cathode can be removed for cleaning by loosening a set-screw, above which the electrolytic circuit is closed.

After setting the speed of flow for the electrolyte, the terminal voltage is gradually increased from 0 volt. This results in the surface, with its grinding grooves, being gradually and quite evenly coated with a brown layer of ever-increasing density. Finally, the layer becomes more transparent, breaking suddenly open and floating off in larger or smaller pieces.

Underneath this layer a bright surface becomes visible which, however, still has some grinding grooves. With a further voltage increase the smoothing process commences, until after a short time the surface is polished. When increasing the voltage still further, gas bubbles form which cause the destruction of the polished surface. An increase in voltage up to this stage must be avoided. Should it occur, nevertheless, the voltage is reduced until no more gas is generated and the polishing action becomes once again effective. When reducing the voltage still more, grain boundaries become apparent. A further slight reduction of the voltage results in a grain surface etching which soon leads to the entire surface being covered with the brown layer. By increasing the voltage, this layer is again removed, as described above. Underneath the floated-off coating the profiling of the structure produced is clearly visible, this being removed only some time afterwards by the effect of polishing.

In the electrolytic polishing and etching of a tin specimen, after gradually increasing the terminal voltage, a dark top layer is formed covering the entire specimen. At somewhat higher voltages, this top layer dissolves in pieces revealing a bright surface still crossed by grinding grooves. At a higher voltage these grooves are rounded off, and soon a polished metal surface is obtained. The structure of the metal surface layer becomes discernible within a second by reducing the voltage. It is the structure of a destroyed, re-crystallized surface layer, as can easily be recognized by increasing the voltage and penetrating further into the metal specimen by electrolytic polishing, meanwhile rendering the structure visible by reducing the voltage for a short time. The shattered, re-crystallized surface layer is removed to an increasing extent, until at last the coarse crystalline structure is revealed corresponding to the actual structure of the cast tin. From now on, further treatment no longer alters the structure of the metal.

TURKEY—I.

WITHIN the framework of Turkey's economic activities, mining, based on the country's considerable geological riches, has attained a pre-eminent position. From both the export point of view and in respect of the balance of payments, it has become an important factor of the very first magnitude in the interest of the country's development and industrialization. As to

Turkey's

the latter, the way to go will be very long, and about 80 per cent of the inhabitants still derive their livelihood from agricultural activities.

Efforts made in recent years towards expanding mining capacity have been responsible for larger imports of mining equipment and other plant intended both for extensions to, and modernization of, existing mines, and for developing new mines. Turkish imports, all told, totalled

Mining

£T882,000,000 in 1958 (as against exports aggregating £T739,000,000), and about half of the imports accounted for capital goods, with mining equipment and plant well to the fore.

The financial aid granted Turkey by the Western Powers in August, 1958, totalling £T359,000,000, is largely designed to enable Turkey to finance her imports, and the government has decided to grant priority to those imports

Industry

which enable Turkey to increase her productivity. In the first place this covers mining, whose products loom so large in the country's exports.

As will be seen from the table contained in this article, exports of the principal ores during the seven months ended February 28, 1959 (i.e. beginning with August 4 last, the date when the country's new economic policy was inaugurated), did not develop in a uniform way. While there were considerable increases in the value of some items (compared with those attained in the corresponding period a year previously), drops occurred in respect of the

by A. E. Bell

values of other ore exports. However, these commercial values do not, in fact, reflect total exports, since considerable volumes of chrome ore, copper, and iron ore, were shipped abroad in compensation for commodities imported in exchange, or to make up for payments in arrears. Since the country's requirements in the way of ores are limited—except for iron ore, which is absorbed in great quantities by the British-built Karabuk iron and steel works in north-western Anatolia (also the country's largest coal consumer)—export values give a fairly approximate indication of output volumes. Otherwise, exact output figures referring to recent periods are extremely hard to obtain.

Iron Ore

Most of the iron ore mined in Turkey originates from the Divrigi deposit in Sivas province, to the east of Ankara, halfway between that town and Erzurum. There are minor mines near Demir Dag (a name meaning Iron Mountain, near the Black Sea port of Trabzon) in Hatay province (on the Mediterranean coast near the Syrian border), near Izmir and a short way from Izmit on the Marmara coast. According to reports available by the end of 1958, Krupps was then stated to be engaged in systematic prospection for iron ore in Hatay province and near Edremit, on the Mediterranean coast, halfway between Izmir and Gallipoli. At the same time, the Turkish Government has been credited with the intention of erecting a steel works (second to Karabuk) and of expanding the capacity of the Karabuk plant, as a scheme in which Krupps has been given a leading role.

The Karabuk extension will enable the annual capacity of that works to be raised to 600,000 tonnes of raw steel per annum. In 1956, the output of all the iron ore mines totalled 350,000 tonnes, nearly five times the 1938 output of 76,800 tonnes. In the same post-war year, Eti Bank, the State-owned bank controlling nearly all mining in Turkey, obtained a West German credit of \$1,200,000, to be used for raising the capacity of iron ore and pyrite mines. To be repaid in kind through deliveries of iron and pyrite ores, this credit has been partly responsible for the reduction of commercial exports. A year before Krupps' interests had already been included in a newly established Turkish Ore Research and Investigation Company (Maden Arama ve Etüd Sirekli) in collaboration with Eti Bank and other Turkish financial institutions.

Chrome and Copper

Chrome ore has, of course, been the mainstay of Turkish mining. It still accounts for 6 per cent of the value of all Turkish exports, but it no longer enjoys the pre-eminence on the international market from which it benefited in pre-war days, when Turkey commanded about a quarter of world chrome ore supplies. Chrome ore from Rhodesia and Pakistan has become a powerful competitor. This accounts for the reduced level of Turkish chrome ore exports in 1958 at 509,092 tonnes as compared with the 1953 total of 900,000 tonnes. High production costs are an explanation for the Turkish chrome ore price of \$52 c.i.f. New York in the first months of 1958, as compared with \$45 demanded by competing sellers, and the United States, for many years Turkey's best customer for chrome ore, has gradually been abstaining from purchases in Turkey. Proceeds from Turkish chrome ore exports dropped accordingly from £T78,000,000 in 1953 to £T55,000,000 in 1956. The country's reserves of chrome ore are valued at more than 7,500,000 tonnes, mostly in the eastern provinces, i.e. near Elazig to the south-east of Divrigi, further east near

PRINCIPAL MINING EXPORTS

	Seven months ending end of February	
	1958 T. £	1959 T. £
Manganese ore	1,700,000	2,012,000
Boracite ore <i>a</i>	3,146,000	3,655,000
Antimony ore <i>b</i>	147,000	328,000
Chrome ore	38,000,000	20,000,000 ^c
Copper ore	12,800,000	7,500,000 ^d
Iron ore	7,300,000	3,900,000 ^e

a Mainly from the rich Susurluk deposit in western Anatolia, near Balikesni to the south of the Sea of Marmara, exporting via Bandirma port.

b Mainly from the Turhal deposit to the south of the Black Sea port of Samsun, where reserves total about 100,000 tons (13,000 tons of metal) and output averages 3,000 tons of ore per annum.

c £T39,000,000 for the corresponding months ending February, 1957.

d £T20,500,000 for the corresponding months ending February, 1957.

e £T7,800,000 for the corresponding months ending February, 1957.

Guleman (the most important chromite site) and near Gaziantep, halfway between Elazig and Hatay province.

There are copper ore deposits in some fifty places nearly all over Turkey, but the most important one in production is that of Ergani, to the south of Guleman. A scheme launched in March, 1959, envisaging an expenditure of £T10,000, is designed to increase considerably capacity at Ergani, and envisages the exploitation of further deposits (valued at 360,000 tons) discovered in 1957. In addition, the Murgul copper mine on the Black Sea near the Soviet frontier, exploited since 1950, is being developed. Total copper ore output in Turkey, at more than 18,000 tonnes in 1957, is planned to reach 24,000 tonnes in 1960. An electrolytic copper-ore smelting works, sponsored by the Turkish Bank of Industrial Development (for which equipment was partly supplied by British firms and partly from Western Germany), was completed at Istanbul in March, 1959. Its capacity, 2,400 tonnes of copper metal by the end of 1959, is gradually to be raised to 6,000 t.p.a.

Mineral Oil

The country's oil resources have been attracting the particular attention of foreign interests. In 1956, the State-owned mineral oil administration produced from their Ramandagh oilfields in eastern Anatolia some 305,620 tonnes of crude, and this annual volume has not since been increased. In 1958, it covered a fifth of the country's needs of oil derivatives. At present, twenty-two Turkish and foreign oil concerns, benefiting from 232 prospecting concessions totalling approximately 41,200 acres, are busily engaged in oil prospecting, partly along the Syrian and Iraqi frontier (near Gaziantep, Mardin, Siirt), partly along the Black Sea coast (in the Sinop area, to the east of the Zonguldak coalfields), partly on the south coast (Antalya province), and partly on the Marmara Sea coast; also in Thrace in European Turkey.

British interests (B.P. and Shell), in collaboration with Caltex and Mobiloil, have joined forces for the establishment of an oil refinery near Mersin, Istanbul (throughput capacity, 3,200,000 tons per annum), the south-eastern port which is earmarked as the terminus of the great pipeline from Qum (Persia). On the other hand, Turkepetrol, a Turkish oil concern, jointly with French oil interests, is building a refinery near Istanbul (throughput capacity, 800,000 tons per annum), to be on stream in 1960.

MINING

MISCELLANY

The Ivory Coast Ministry of Public Works has announced that a Geological and Mineral Prospecting Service is to be established at Abidjan.

A number of new borax deposits have been discovered in the Emet area of Turkey, west of Kutahya, and one of them is being exploited by the Etibank.

According to an article appearing in the Tirana newspaper, *Zeri i Popullit*, Albania's mineral production for 1958 included 201,252 tonnes of chromite, 87,460 tonnes of copper ore, and 88,240 tonnes of iron ore.

A method for transforming a low-grade Labrador iron ore into a high-grade product was described to the Chemical Institute of Canada at its annual convention by G. E. Viens, G. V. Sirianni, and R. R. Rogers, all of Ottawa. The investigators used a Labrador hematite ore containing 37.7 per cent iron. It was roasted under reducing conditions to produce magnetite. The magnetite was separated from the other components and was found to contain 71 per cent iron ore.

The Jackpot Oil Co. recently announced a new gold "strike" made only 110 ft. below former workings of its Bald Eagle mine at Idaho Springs, Colorado. An independent mining engineer's report states that the new body contains 200,000 tons of inferred ore having an estimated recoverable value of \$6,600,000.

The board of the Chromium Mining and Smelting Corporation has approved

capital expenditures amounting to approximately \$2,000,000 for the fiscal year ending April 30, 1960. More than half the money is to be spent at the corporation's smelter at Memphis, Tennessee. Major improvements are to be made at the Riverdale, Illinois, plant, and there will also be capital expenditures on immediate planned improvements at the Beauharnois, Quebec, plant.

A meeting held in Paris on May 22 was attended by producers of pyrites and sulphur with the object of forming a non-profit-making International Sulphur Institute. It was agreed to proceed with the formation of the proposed institute with the object of discovering new uses and extending the application of existing uses of sulphur in all forms throughout the world. It will be some time before the constitution and membership can be finally established.

According to a Bangkok source, the barter deal under which Thailand is to sell to the United States 2,250 tons of tin in exchange for U.S. tobacco is now likely to be consummated. Difficulties which arose concerning the transfer value of the tobacco are said to have been overcome. The International Tin Council has sanctioned the deal subject to completion by August 31 this year.

Delegates from the copper and copper alloy fabricating industries of thirteen Western European countries were present when the General Assembly of the International Wrought Non-Ferrous Metals Council met in Copenhagen on June 15, under the chairmanship of Mr. C. A. Jacobsson, of Sweden. Mr. Jacobsson will be retiring from the chairmanship

of the International Council in October, and the General Assembly unanimously elected Mr. W. Ertel, of Germany, as his successor. The Hon. J. Grimston, M.P., of Great Britain, has been unanimously elected a vice-chairman. The other vice-chairman of the International Council is Dr. A. De Meuron, of Switzerland. The General Assembly proposes to meet next in Switzerland in June, 1960.

PERSONAL

Professor John Stuart Anderson has been appointed as Director of the National Chemical Laboratory of the Department of Scientific and Industrial Research. Dr. Anderson is Professor of Inorganic and Physical Chemistry at the University of Melbourne, Australia. He will succeed the retiring director, Dr. D. D. Pratt, and is expected to take up his new duties in October.

Mr. R. Hughes has been appointed assistant general manager and Mr. E. T. Lodge works manager of Head Wrightson Stockton Forge Ltd., a subsidiary of Head Wrightson and Co. Ltd.

Mr. J. Sturt Anderson, whose resignation as deputy provincial treasurer of the Province of Manitoba has just been announced, has been elected assistant to the vice-president and also assistant treasurer of the International Nickel Co. of Canada Ltd. Mr. Anderson has also been elected assistant vice-president and assistant treasurer of the International Nickel Co. Inc., the company's U.S. subsidiary.

AGENCY WANTED

The Australian firm Scotts of Ipswich, 335 Brisbane St., West Ipswich, Queensland (P.O. Box 52Q) is investigating the possibility of obtaining manufacturing licences for machinery used in the coal and metalliferous mining industries, the sugar milling industry, and pneumatic conveying. B.O.T. Ref.: ESB/10507/59.

CONTRACTS AND TENDERS

Simon-Carves (Australia) Pty. has won a contract worth between £A1,000,000 and £A2,000,000 to build a large lead and zinc sinter plant for the Sulphide Corporation Pty. at Cockle Creek, near Newcastle. This plant will be an important element in the £A8,000,000 zinc smelter project recently announced by Consolidated Zinc. The smelter will draw on concentrates from the Broken Hill field, and in addition to producing zinc and lead metal will use the sulphur content to make sulphuric acid. It has been stated that 93 per cent of the contract value of the plant will be obtained in Australia. A British sinter plant expert from Huntington Heberlein and Co. will supervise the design of the plant.

The Magnetic Equipment Co. Ltd. is now engaged in the production of an order for the Dutch coal mines for the supply of 44 of its 400-ton-per-hour vibratory feeders, type SVF4. These will handle a wide range of coal from very fine dust to medium lumps, all units being employed in conjunction with an automatic weighing equipment for the mixing of coal in the specified grades according to the ash content. The Dutch order was obtained with the co-operation of M.E.'s German associates, Dr. Ing. Carl Kuttner, of Essen.

A 14-seater coach built to the order of Rootes Ltd. (Export Division) by Reading and Co. Ltd., for service with the Ashanti Goldfields Corporation in Ghana. Of light alloy construction, the body is fully insulated



Machinery and Equipment

A New Drill Rig

A self-propelled track-mounted drilling rig, mounting a 4 in. or 4½ in. drifter, has been introduced by the Consolidated Pneumatic Tool Co. for completely self-contained large diameter deep hole drilling operations in opencast mines and quarries. In this unit two 6 b.h.p. Power Vane reversible motors provide the motive power for propelling the rig round the site at a speed of 2½ m.p.h. whilst towing a 365-RO-2 Power Vane compressor, which supplies the compressed air.

The rig carries a drilling mast which is retracted to the horizontal position for travelling or positioned at any angle for drilling by means of hydraulic cylinders, these being operated by a large capacity air-operated hydraulic pump. The unit can also be supplied with a further pair of cylinders for inclining or swinging the drill carriage, thus reducing fatigue and making positioning fully automatic. Other features include heavy duty multiple disc brakes which eliminate movement during drilling, a throw-out clutch for towing, and a hydraulic drill positioner control panel. The crawler control is of the spring-loaded deadman type and gives forward, reverse, turning, and pivoting movements. Of particular interest is the totally enclosed drive, all motor parts, brake components, clutch and drive gearings being fully enclosed to protect them from dirt and damage. To ensure efficient lubrication, a large air strainer and line oiler is fitted.

The unit has a low centre of gravity, and this combined with independent operation of the 10 in. wide tracks enables stability of the carriage to be maintained in rough conditions. The drill

used is the CP.400 or CP.450, these being 4 in. and 4½ in. piston units respectively.

Specifications of the Tracdrill include an overall length of 86½ in., a width of 84 in., and a maximum height with mast lowered of 44 in. It has a ground clearance of 14 in. The total weight complete with drill carriage and drill is 5,265 lb.

FLAME-PROOF MOTOR FOR MINING

The requirement for a flame-proof motor for mining which would deliver up to 75 h.p. at 1,470 r.p.m., and yet which dimensionally was no higher than 12 in., although the standard type of this rating would require to be 24 in. high, has been met by the Electric Motors Division of Newman Industries Ltd.

The rating presented primarily a problem of temperature control, and it was decided that water-cooling would be the most efficient method. But even after this decision had been made, the size specification stretched design ingenuity to the limit for the compression of the iron and copper requirements of 75 h.p. and a water-cooling jacket into the stipulated area presented many difficulties.

While the development of this motor was inspired by a particular demand, the result has a broad interest with industry generally in constant search of smaller yet more powerful and efficient equipment. In this case, an electric motor has been produced which equals in performance and yet, in cross-section, takes up only half the area of the conventional design.

The motor is continuously rated at 75 h.p. 1,470 r.p.m. on a 50-cycle three-phase supply. The starting and break-down torques are twice the full load value and the starting current is four and a half times the full load current when switched direct on line. The motor is Class B insulated, but with five gallons of cooling water flowing per minute the temperature rise measured by change of resistance method does not, in fact, exceed 55 deg. C. and is, therefore, well within the Class A limits.

Construction is all steel. The water jacket round the stator is complete in itself and none of the motor components form part of its construction. There is, therefore, no danger of water leakage into the motor. The water jacket is designed for working pressures up to 500 lb./sq. in.

The motor is fitted with grease lubricated ball and roller bearings. A thermostat mounted on the motor windings has its leads brought into the terminal box for connecting in the motor control circuit as a precaution against overloading or the winding reaching too high a temperature in the event of the water supply being cut off.

CABLED NYLON TUBES

British Insulated Callender's Cables Ltd. announce that in addition to their cabled copper tubes they are now manufacturing a range of cabled nylon tubes. Typical applications include the remote monitoring of processes and equipment in chemical plants and oil refineries by pneumatic or fluid-operated meters and other indicating devices.

The tubes, of which there may be 1, 3, 4, 7, 12 or 19 in a "cable", are identified by colour. They are laid up in electric cable fashion and sheathed overall with PVC (polyvinyl chloride) or PCP (polychloroprene). If desired, they can be provided with steel wire armour protection. No special type of support is required for these cabled nylon tubes.

HEAVY ROLLER CHAINS

The introduction of a series of heavy roller chains for industrial power transmission has been announced by Precision Chains Ltd. These chains meet the specification of the American Standards Association (A.S.A.) and because of their greater breaking load are able to transmit more power than the British Standard chains of the same pitch.

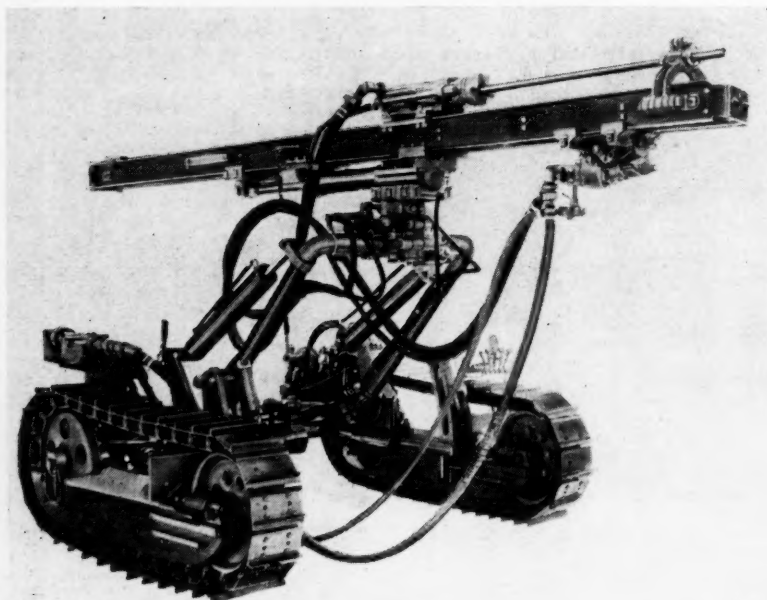
AN ELECTRIC PERCUSSION ROCK DRILL

Smooth-hole reaming effect of positive rotation, together with the power efficiency and compactness of an electric drive, have been achieved in a 65 lb. rock drill made by Robert Bosch GmbH in Germany and sold in the United States through Homelite Corp. Speeds of 6½ ft. per min. have been reported in Bolivia. The machine can drill 2 in. holes over 20 ft. deep or 4 in. short holes.

The 1.2 kW. 265 or 120 v. 200-cycle a.c. used in the machine can be furnished through a 200 lb. frequency changer attached to a normal three-phase power line or by a 450 lb. movable diesel generator or by a 143 lb. petrol generator.

The machine can use standard U.S. drill steel rods (including ½ in. hex.) and tungsten carbide bits.

The new Consolidated Pneumatic G800 Tracdrill



Metals and Minerals

Molybdenum and Vanadium in 1958

Since both molybdenum and vanadium find by far their largest outlets in the steel industry, it was inevitable that the decline in United States steel production, which fell last year to 77,200,000 tonnes from the 1957 figure of 102,253,000 tonnes, should be accompanied by a steep reduction in the world output of both these metals.

According to the Bureau of Mines, U.S. Department of the Interior, estimated world production of molybdenum was 26 per cent less than the 1957 total, the respective figures being 28,250 and 38,100 s.tons. Despite a decline from 30,376 s.tons to 20,535 s.tons—the lowest output for seven years—the United States remained by far the largest producer, accounting for 89 per cent of the Free World total. In Chile, output remained virtually unchanged at approximately 1,500 s.tons. No reliable information is available regarding molybdenum production in the U.S.S.R. and other Communist countries and areas, but the Russian production is placed at 4,650 s.tons.

Compared with 1957, consumption of molybdenum products in the United States declined by 19 per cent, due mainly to curtailed demand for molybdenum products in making alloy steel, but the quantity consumed in metal shapes more than doubled due to expanded use in missiles and aircraft. Over 12 s.tons of molybdenum were reported to have been used in the manufacture of friction materials, brake linings, and rubber products; 1 s.ton as a trace element in fertilizers; 3 s.tons in making electrical contacts; and 3 s.tons in molybdenum-bearing titanium alloys. Stocks of molybdenum concentrates at mines and plants making molybdenum products declined during 1958 by 20 per cent.

As might be expected, the molybdenum situation in the United States has been radically altered since the recovery in the steel industry. The latest available figures show that United States production and shipments of molybdenum contained in products increased by 4 and 23 per cent in the first three months of 1959, compared with the corresponding period in 1958. Consumption of molybdenum contained in products during January, 1959, was the highest in any month since May, 1957.

In its review of 1958, the Bureau of Mines states that the chief features of the vanadium industry were a small decrease in the output of vanadium in ore and concentrate, a 23 per cent decrease in the production of vanadium pentoxide, a 55 per cent decrease in the production of ferrovanadium, a 30 per cent decrease in the consumption of vanadium products, and decreases in exports of both ferrovanadium and vanadium pentoxide.

Vanadium ore mining in the United States continued to be centred on the Colorado Plateau. For the first time since 1948 there was a decrease in the production of vanadium in ore and concentrates. The 1959 output of 7,266 s.tons was approximately $\frac{1}{2}$ per cent less than the previous year's production.

Outside of the United States, production of vanadium was limited almost entirely to Angola, South West Africa,

the Transvaal, and Finland. The estimated world total for 1958 was 4,231 s.tons against 4,295 s.tons in the previous year. In South West Africa, the output of recoverable vanadium was increased to 435 s.tons (305). In the Transvaal, output rose to 316 s.tons from the previous year's total of 8 tons. Approximately 10,000 tons of magnetite ore containing about 1.6 per cent V_2O_5 was processed monthly by the Minerals Engineering Co. of South Africa (Pty.) Ltd. to produce a vanadium-bearing product containing over 98 per cent V_2O_5 , which was shipped to European customers. The scale of future operations depends upon market requirements.

Early last year, additional equipment was installed at the Otanmaki plant in Finland which could bring the production of vanadium pentoxide up to 992 to 1,102 s.tons per year.

Substantially improved specifications for vanadium metal, particularly as regards gaseous impurities, have been announced by Union Carbide Metals Co., division of Union Carbide Corporation. Through the use of improved production methods, it has been possible to cut hydrogen content by 90 per cent and nitrogen and carbon contents by 50 per cent. Actual analyses frequently show that the sum total of carbon, hydrogen, and nitrogen is less than the 0.2 per cent indicated by the new specifications.

According to Union Carbide, vanadium's largest potential is probably in the field of atomic energy. Here this metal may be used as a thin-wall tubing to clad the uranium fuel elements as the operating temperatures of the newer, fast-breeder reactors are raised to achieve greater efficiency. Vanadium is being considered for this role because it does not form brittle or low melting eutectic alloys with uranium, and because it also strongly resists the corrosion of the liquid sodium coolant used in such reactors. It has a moderately low neutron capture cross-section. With the degree of purity now being achieved, an even more ductile and workable product is obtained.

NEW NATURAL DIAMOND GRIT

Following intensive research at the Diamond Research Laboratory in Johannesburg, the value of natural diamonds for specific industrial uses has been considerably increased. It is claimed that, as a result, the competition that has arisen from the introduction of synthetic diamond grit manufactured by the General Electric Co. of America can be fully met by the natural industrial diamond.

Two new products which, for the first time, had been specially prepared from natural diamonds were recently demonstrated in Johannesburg. These were a new, natural diamond grit for resin-bonded grinding wheels, claimed to be 40 per cent more efficient than any natural grit previously used, and diamond drilling material which, prepared to the specific shape and size required for particular diamond drilling operations, has proved greatly superior to any hitherto used.

The new natural grit is already being tested in the United States and elsewhere. Its chief use will be in industries which grind tungsten carbide tools—e.g. in the manufacture of motor-car and aircraft engine parts and other metal articles in which accuracies to thousandths of parts of an inch are necessary. The more efficient functioning of the resin bonded wheels and their longer life will, it is believed, prove a factor in the reduction of manufacturing costs.

The principal difference between the old process and the new is that the old grit consisted of solid blocky particles which had a tendency to tear out of the resin bond, while the new grit has had the blocky particles removed and consists of friable irregularly shaped particles which wear down gradually, leaving the bulk of the particle firmly embedded in the bond. The new grit is being used only in resin bonded wheels. For metal bonded wheels, the block particles will continue to be employed, since it has been established that, where operating pressures are high, blocky shapes are held more firmly in the tough metal bond, and the full strength of natural diamond can thus be utilized.

The new material for diamond drills will give them considerably longer life.

ALUMINIUM AND BAUXITE

Alcoa and the AFL-CIO Aluminium Workers' International Union will begin negotiations on June 24 to work out new labour contracts to replace those expiring on July 31. This is the first formal session scheduled by the largest United States aluminium producer as the major contract talks approach.

Mr. D. A. Rhoades, vice-president and general manager of Kaiser, is reported as stating that, even if no wage increases resulted from the talks, the aluminium industry "would be looking hard" at foreign market conditions with an eye towards raising prices. He added that the very small rise last August barely covered wage increases at the time. However, Mr. Rhoades does not expect any price rise later this year to amount to as much as 2 cents.

Anaconda Aluminium Co. is to reactivate about thirty pots to produce aluminium metal at its reduction works at Columbia Falls, Montana. The new production level will bring output up to an annual rate of 57,000 tons or approximately 88 per cent of capacity.

Much further detailed investigation will be necessary before a final conclusion can be reached on the chances of a £60,000,000 New Zealand aluminium industry being established, states Mr. C. W. O. Turner, Engineer-in-Chief of the Ministry of Works. Mr. Turner returned recently from Australia, where he had talks with the Commonwealth Aluminium Corporation Pty. Ltd. on the question of establishing the industry in New Zealand. The corporation is already investigating alternative methods of getting the power needed for the industry.

Japan's three aluminium refining companies hope to increase their production capacity from the present 105,000 tons annually to 134,000 tons by March, 1960, under the present expansion programme. The target will approach the war-time peak production of 136,787 tons reached in 1944.

COPPER • TIN • LEAD • ZINC

(From Our London Metal Exchange Correspondent)

The past week has been an eventful one as far as copper is concerned, and the overall picture has altered following the sharp drop in world prices which has taken place. Meanwhile lead and zinc have moved higher and tin has staged a good recovery from a slight setback at the end of last week.

COPPER IN SURPLUS IF NO STRIKE

Speaking generally, it can be said that the London copper market continues to follow New York, and a brief rally at the end of last week on the commodity exchange encouraged a similar movement in London. However, this proved short-lived, and early in the week three months copper was traded at the lowest since the upward movement started at the turn of the year.

A bearish factor was the announcement that a possible strike at the Chuquicamata property of the Anaconda company has been averted follow-

ing agreement between Union leaders and employers on a new wage contract. No precise details have been made known of the settlement. As far as similar negotiations in the United States are concerned, it is reported that these have now reached a crucial stage and opinion is growing that, provided the Union considers some progress has been made by the end of this month, strike action may be delayed. Immediately following these factors the United States' and world statistics for May became known and caused keen disappointment in the trade generally, mainly on account of the sharp increase in stocks both in and outside the United States as the figures below (in s.tons) show.

In addition, sentiment was affected adversely by an increase in stocks in London Metal Exchange official warehouses at the end of last week of 546 tons to 13,858 tons. During this period the customs smelter price in America has been lowered $\frac{1}{2}$ c. to 31 $\frac{1}{2}$ c. following a $\frac{1}{2}$ c. reduction to 25 c. in the scrap price, but with dealer copper on offer at 30 $\frac{1}{2}$ c.,

	United States		World	
	May	April	May	April
Refined production	135,967	137,490	148,141	141,469
Deliveries	134,585	135,233	132,198	135,029
Stocks	86,132	74,323	264,640	255,548

LONDON METAL AND ORE PRICES, JUNE 18, 1959

METAL PRICES

Aluminium, 99.5%, £180 per ton
Antimony—
English (99%) delivered, 10 cwt. and over £190 per ton
Crude (70%) £190 per ton
Ore (60%) bases 19s. 6d./20s. 6d. nom. per unit, c.i.f.
Arsenic, £400 per ton
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 9s. 0d. lb.
Cerium (99%) net, £16 0s. lb. delivered U.K.
Chromium, Cr. 99% 6s. 11d./7s. 4d. lb.
Cobalt, 14s. lb.
Germanium, 99.99%, Ge. kilo lots 2s. 5d. per gram.
Gold, 249s. 8½d.

Iridium, £23/£25 oz. nom.
Lanthanum (98/99%) 15s. per gram.
Manganese Metal (96% - 98%) £245/£250
Magnesium, 2s. 3d. lb.
Nickel, 99.3% (home trade) £600 per ton
Osmium, £21/£23 oz. nom.
Osmiridium, nom.
Palladium, £6 10s./£7 10s.
Platinum U.K. and Empire Refined £28 10s. oz.
Imported £26½/£27½
Quicksilver, £77 ex-warehouse
Rhodium, £41/£45 oz.
Ruthenium, £18/£20 oz. nom.
Selenium, 50s. 0d. per lb.
Silver, 78½d. f. oz. spot and 77½d. f'd
Tellurium, 15s./16s. lb.

ORES AND OXIDES

Bismuth	30% 5s. 0d. lb. c.i.f.	
	20% 3s. 3d. lb. c.i.f.	
Chrome Ore—		
Rhodesian Metallurgical (semifriable) 48%	(Ratio 3:1)	£15 15s. 0d. per ton c.i.f.
" Hard Lumpy 45%	(Ratio 3:1)	£15 10s. 0d. per ton c.i.f.
" Refractory 40%	(Ratio 3:1)	£11 0s. 0d. per ton c.i.f.
" Smalls 44%	(Ratio 3:1)	£14 0s. 0d. per ton c.i.f.
Baichistan 48%	(Ratio 3:1)	£11 15s. 0d. per ton f.o.b.
Columbite, 65% combined oxides, high grade	nom.
Fluorspar—		
Acid Grade, Flotated Material	£22 13s. 3d. per ton ex. works
Metallurgical (75/80% CaF ₂)	156s. 0d. ex works
Lithium Ore—		
Petalite min. 34% Li ₂ O	40s. 0d./45s. 0d. per unit f.o.b. Beira
Lepidolite min. 34% Li ₂ O	40s. 0d./45s. 0d. per unit f.o.b. Beira
Amblygonite basis 7% Li ₂ O	£25 0s. per ton f.o.b. Beira
Magnetite, ground calcined	£28 0s./£30 0s. d/d
Magnetite Raw (ground)	£21 0s./£23 0s. d/d
Manganese Ore Indian—		
Europe (46% - 48%) basis 57s. 6d. freight	nom.
Manganese Ore (43% - 45%)	nom.
Manganese Ore (38% - 40%)	nom.
Molybdenite (85%) basis	8s. 11d. per lb. (f.o.b.)
Titanium Ore—		
Rutile 95/97% TiO ₂ (prompt delivery)	£31/£33 per ton c.i.f. Aust'n.
Ilmenite 52/54% TiO ₂	£11 10s. per ton c.i.f. Malayan
Wolfram and Scheelite (65%)	97s. 6d./103s. 6d. per unit c.i.f.
Vanadium—		
Pure oxide 95% V ₂ O ₅	8s./8s. 11d. per lb. V ₂ O ₅ c.i.f.
Zircon Sand (Australian) 65% 66% 70%	£17 0s. ton c.i.f.

interest has been negligible and the customs price has come under renewed pressure. Producers, on the other hand, are now selling for July and report sales satisfactory considering the approach of the holiday months.

The Belgian price has also been lowered twice this week a total of 1 $\frac{1}{2}$ B.frs. per kilo and now stands at 31 $\frac{1}{2}$ B.frs. per kilo. Trading on the commodity exchange has been especially active, mainly as a result of the liquidation of speculative positions. The near future outlook for copper continues uncertain, but it is becoming increasingly clear at this point that with stocks at their present level and consumers apparently well covered, only a prolonged strike coupled with a genuine improvement in consumption can bring about any marked upward movement.

BUFFER STOCK SELLING EASES

The tin market has undergone no change during the week. In the face of moderate demand on both sides of the Atlantic and with less evidence of selling pressure on the part of the buffer pool, the recent price level has been well maintained.

Shipments from Singapore in the first half of June totalled 30 $\frac{1}{2}$ tons, whilst from Penang the figure was 1,331 $\frac{1}{2}$. These compare respectively with 6 $\frac{1}{2}$ tons and 2,210 $\frac{1}{2}$ tons in the first half of May. Stocks in London Metal Exchange official warehouses increased by 20 tons last week to 7,796 tons.

On Thursday morning the Eastern price was equivalent to £818 $\frac{1}{2}$ per ton c.i.f. London.

ZINC FIRM—LEAD SLACK

Demand for lead has been quieter this week and with the prospect of supplies being plentiful in the coming months, consumers are showing no anxiety to cover their requirements. Zinc continues in a satisfactory position and, in the absence of any selling pressure on nearby metal, a small backwardation has been maintained.

From Australia comes the suggestion that the government there should consider stockpiling domestically produced lead and zinc pending the stabilization of world prices, whilst in the United States a bill has been introduced whereby 4 c. per lb. import tax would become effective on imported lead and zinc when the domestic price fell below 15 $\frac{1}{2}$ c. to 13 $\frac{1}{2}$ c. respectively.

Closing prices up to midday, June 18, are as follows:

	June 11		June 18	
	Buyers	Sellers	Buyers	Sellers
COPPER				
Cash	£234	£234½	£224½	£225
Three months ..	£233	£233½	£225½	£225½
Settlement ..			£225	
Week's turnover	11,700 tons		11,950 tons	
LEAD				
Current ½ month	£68½	£68½	£69½	£70
Three months ..	£70½	£70½	£71	£71½
Settlement ..			£70	
Week's turnover	6,775 tons		5,000 tons	
TIN				
Cash	£786½	£787	£789½	£790
Three months ..	£786½	£787	£790	£790½
Settlement ..			£790	
Week's turnover	1,155 tons		515 tons	
ZINC				
Current ½ month	£77	£77½	£78½	£79
Three months ..	£76½	£76½	£77½	£77½
Settlement ..				
Week's turnover	3,700 tons		4,025 tons	

Mining Finance

Diamonds From The Protectorates

The present increase in the tempo of prospecting operations, referred to in these columns last week, is not confined to gold alone. Two announcements during recent weeks have indicated that the search for diamonds is also accelerating.

At the De Beers' annual meeting, Mr. H. Oppenheimer announced the conclusion of an agreement giving De Beers an interest in exclusive prospecting operations in Basutoland. Field work in the Territory was begun three years ago by Mr. Jack Scott, who had obtained the exclusive diamond prospecting rights from the paramount chief. Mr. Scott, it will be remembered, was largely responsible for the proving of the Hartbeestfontein, Stilfontein, and Buffelsfontein mines of the Far West Rand.

Mr. Scott will continue to direct the work personally, but under the terms of the agreement, the advice of De Beers' consulting geologists and the services of the organization's research laboratories will be available to him. No payable deposit has yet been proved, but a number of Kimberlite occurrences, some diamondiferous, have been investigated.

Should any diamonds be produced from Basutoland, sales will be made through the Central Selling Organization so that the structure of the trade would not be disrupted.

The other item of prospecting news derives from the recent conclusion of an agreement between Rhodesian Selection Trust and the Bamangwato Tribal

Authority. It is understood in Salisbury that diamonds are specifically excluded from the agreement, and that R.S.T.'s sister company, Consolidated African Selection Trust, will negotiate a separate agreement with the B.T.A. Should such an agreement be concluded, it is almost certain that sales of any diamonds produced would be made through the C.S.O. There is, of course, no local diamond market in Bechuanaland, thus there can be no question of pressure being applied in an attempt to make Casts sell outside the usual channels.

In any case, it must be remembered that even if payable deposits are discovered in either locality, the production stage would still be several years away. The prospecting operations, too, will probably be fairly protracted, the terrain of both territories being extremely difficult.

DIAMOND SALES STILL GOOD

At the De Beers' meeting, Mr. Oppenheimer also referred to the current level of diamond sales. The gem trade for the first five months of the year had totalled £25,517,460, while industrial sales had topped £12,240,000. These figures compare with £17,983,758 and £6,854,499 in the corresponding period of last year.

The sharp improvement in the industrial side of the trade is still largely due to American barter arrangements for stockpile. The rise in gem sales, on the

other hand, appears to result from a real widening of demand, possibly related to currency fears in the United States.

NO NEWS IS NOT GOOD NEWS

In his statement to Stilfontein shareholders (page 681), Mr. J. Scott, the chairman, amplifies the low development values and payability reported in the March quarter. It appears that development in the deeper areas between the Charles and Margaret shafts began to encounter a zone of low payability towards the end of last year. Signs of an improvement are now beginning to appear, but the dilution of mill feed coupled with an advance in the capital programme in an attempt to offset the low values, means that the immediate dividend future for Stilfontein is rather more doubtful than had been thought.

Mr. Scott's statement should end the conflicting rumours which have circulated during the last few months. It also raises a more fundamental question. When a sudden upturn or deterioration in development values occurs, it is almost impossible to prevent a leakage, however efficient the security measures, and it is in the nature of things that such a leakage will become exaggerated in transmission. Mr. Scott says that a "pre-mature" statement might have given a wrong impression. It might be added that no statement at all is certain to give a wrong impression.

FINAL KAFFIR PAYMENTS

The summer Kaffir dividend season closed last week. With only one mine under 20 years old among the latest distribution lists, the absence of sharp changes was to be expected. Only Blyvoor was able to announce an increase in its distribution compared with the previous half-year's payment, although several other mines have declared dividends higher than their corresponding payments last year, as can be seen from the comparative table below.

Mine	Dec. 1957	June 1958	Dec. 1958	June 1959
Rand Mines				
Blyvoor	1/-	1/-	1/-	1/1
City Deep	6	6	7½	7½
Cons. M.R.	1/3	1/3	1/6	1/6
Crown	1/3	1/6	1/9	1/9
Durban	1/6	1/6	1/6	1/6
E.R.P.M.	2/3	2/-	2/-	1/9
Modder E.	9	9	6	6
J.C.I.				
E. Champ	4	3	3	3
Randfontein	2/3	2/-	2/3	1/9
Union Corporation				
E. Geduld	2/-	1/9	1/11	1/9
Geduld P.	6/6	5/-	6/3	4/9
Grootvlei	1/3	1/1	1/3	1/1
Marievale	1/3	1/1	1/5	1/4
Anglo-Transvaal				
Hartbeest	3/-	3/6	3/6	3/6
Rand Leases	3	1½	9*	—

* Capital.

At the annual meeting of City Deep, Mr. P. H. Anderson, the chairman, said that the time was not appropriate for the company to begin capital repayments. It was advisable, he said, for the company to retain its strong capital resources against the considerable expenditure which might be required for the opening-up of the mine in the deeper levels. In answer to a question, Mr. Anderson said that he had no further information concerning the proposed sale of 260 acres to the City Council of Johannesburg.

LONDON MARKET HIGHLIGHTS

In the early part of the week, the South African gold share market seemed to be poised for one of its periodic upswings. Business was held in check by the approaching end of the Account, but prices steadily edged higher.

The beginning of the new Account on Wednesday was greeted by a burst of strength in Orange Free State issues. For once in a while London took the initiative in the early dealings by bidding tentatively for Free State Geduld and Western Holdings. This had an immediate effect on Johannesburg, which then came in strongly for all of its O.F.S. favourites. The result was that Free State Geduld (197s. 6d.) and Western Holdings (170s.) were soon several shillings higher with talk of high development values accompanying the rise in the latter share. After their setback of the previous week, St. Helena recovered strongly to 64s. on Johannesburg buying. Welkom (26s. 3d.) continued to be in demand, Continental buyers finding little stock available in London.

One of the few weak spots earlier had been Free State Saaiplaas, which reacted to 20s. 9d. following Johannesburg rumours of water trouble at the mine. The rumours appeared to be short-lived, however, because the shares soon rebounded to 21s. 3d.

The older mines moved narrowly. East Rand Proprietary were depressed at around 46s. 9d. on disappointment with

the latest half-yearly dividend; in view of the mine's heavy capital commitments in its deep-level programme, dividends can hardly be expected to be very exciting for a year or two yet.

In a generally firm Finance group, Anglo American moved steadily ahead to 195s. Attention was drawn to the good yield and dividend prospects of Anglo-French and the shares advanced to 33s. 3d.

Base-metal sections were dull for the most part. Coppers had to contend with a weakening metal price and a rather nervous Wall Street market. Selling, however, was remarkably small, and the impression was gained that this share group could quickly respond to a genuine recovery on Wall Street. Kentan jumped to 44s. 9d. on the appearance of a buyer in what was a rather restricted market.

Lead-zincs remained out of the picture, Consolidated Zinc falling on successive days to a rather uncertain 63s. 9d. Tins, too, found little support, although prices eased only slightly. The news of a one-for-one scrip issue failed to stimulate Tanjong, which remained at 22s. 6d. and look to be an attractive purchase at this price.

In the Miscellaneous sections, there was the usual lively trading in Retia Phoenix, which on one day fell from 7s. to 5s. 6d., only to close at 7s. again; there is still no news about the company's future.

Rand and Orange Free State Returns for May

GOLD OUTPUT AND PROFIT

Company	May 1959			Year ends	Current Financial Year Total to date			Last Financial Year Total to date	Profit† (£000)
	Tons (000)	Yield (oz.)	Profit† (£000)		Tons (000)	Yield (oz.)	Profit† (£000)		
Gold Fields									
Doornfontein	92	37,790	187.9	J	974	404,144	2060.4	944	387,595
Libanon	105	24,681	57.6	J	1,088	257,502	594.4	1,208	252,490
Luipaards Vlei	58	10,278	L26.8	J	760	132,414	25.7	783	140,091
Rietfontein	16	4,137	6.7	D	80	21,003	35.5	111	25,353
Robinson	55	12,292	1.3	D	309	65,332	L72.2	359	76,647
Simmer & Jack	88	16,256	L15.7	D	437	81,810	L38.0	428	83,003
Sub Nigel	66	15,933	25.8	J	725	174,593	268.0	724	182,013
Venterspost	130	31,883	59.5	J	1,407	349,919	639.2	1,337	321,926
Vlakfontein	51	18,231	86.5	D	250	89,843	423.7	246	86,692
Vogels	91	20,276	34.5	D	463	104,283	197.9	479	107,792
West Drie	95	86,713	715.2	J	925	871,532	7128.1	832	797,900
Anglo American									
Brakpan	142	16,915	12.5	D	685	82,585	52.2	614	83,238
Daggas	244	49,055	237.2	D	1,187	241,241	1205.4	1,122	235,346
East Daggas	102	16,992	33.4	D	487	81,004	150.0	449	74,622
F. S. Geduld	84	65,966	493.0	S	614	469,814	3446.9	518	370,880
President Brand	110	83,319	768.7	S	797	609,789	5283.0	607	453,526
President Steyn	107	41,200	206.9	S	769	299,022	1516.6	749	320,607
S.A. Lands	99	20,765	58.0	D	469	98,548	279.6	437	99,438
Springs	105	14,228	13.3	D	517	70,754	54.9	627	69,835
Vaal Reefs	90	40,725	208.0	D	417	188,987	1011.7	342	153,443
Welkom	101	30,754	81.9	S	746	227,244	624.3	664	196,397
Western Holdings	126	76,545	588.1	S	846	504,932	3840.8	769	409,838
West. Reefs. Ex.	138	36,018	108.1	D	610	158,321	447.1	555	130,023
Central Mining									
Blyvoor	132	83,816	602.7	J	1,217	792,829	5722.2	1,143	672,092
City Deep	116	24,133	10.0	D	567	118,718	51.6	717	136,421
Cons. M.R.	123	19,335	12.3	J	1,473	221,611	153.9	1,713	244,832
Crown	230	35,487	12.1	D	1,104	173,259	46.3	1,137	174,134
D. Roodepoort	193	35,927	54.8	D	930	172,058	262.5	891	161,123
East Rand Prop.	229	57,973	125.1	D	1,097	283,717	603.4	992	280,920
Harmony	133	51,948	221.3	J	1,171	467,175	1861.3	874	351,416
Modder East	136	13,655	2.7	J	1,467	145,616	24.6	1,507	149,657
Rose Deep	43	5,263	0.6	D	200	26,496	1.1	285	38,346
J.C.I.*									
Freddies Cons.	58	14,147	L37.3	D	282	69,917	L183.2	245	77,203
Govt. G.M.A.	51	10,603	0.7	D	268	53,238	L15.3	313	53,889
Randfontein	40	6,320	10.1	D	163	27,834	43.5	141	23,190
Union Corporation									
East Geduld	142	42,247	284.2	D	670	203,275	1363.3	628	193,125
Geduld Prop.	75	13,988	32.6	D	354	65,732	97.5	406	64,015
Grootvlei	215	45,498	241.1	D	1,015	215,080	1072.9	970	206,632
Marievale	95	23,221	113.7	D	453	113,203	540.6	354	92,948
St. Helena	150	45,002	239.2	D	715	213,243	1122.6	574	169,035
Van Dyk	77	14,205	28.0	D	381	71,247	128.3	376	68,761
Winkelhaak	78	19,305	40.7	D	358	85,787	136.7	—	—
General Mining									
Buffelsfontein	138	51,591	267.7	J	1,378	475,963	2239.0	1,216	399,775
Ellaton	32	7,400	29.0	D	155	36,236	148.6	159	36,812
S. Roodepoort	29	7,011	22.7	J	326	77,671	258.1	322	76,099
Stillfontein	145	69,744	414.3	D	675	335,672	2082.5	547	271,479
W. Rand Cons.	142	21,111	23.2	D	664	96,341	86.9	728	88,964
Anglo Transvaal									
Hartebeestfontein	89	48,505	327.4	J	956	181,312	3520.7	931	510,800
Lorraine	78	15,210	L19.4	S	602	117,476	L151.8	518	97,770
N. Klerksdorp	11	1,198	L9.1	D	51	5,360	L44.9	51	5,470
Rand Leases	191	28,393	20.6	J	2,011	295,690	163.8	1,857	280,944
Village M.R.	26	4,680	1.0	J	293	47,523	9.8	344	56,074
Virginia O.F.S.	134	31,996	10.2	J	1,277	294,251	331.9	1,102	275,017
Others									
N. Kleinfontein	83	10,584	3.0	D	412	53,665	15.4	456	53,888
Wit Nigel	18	4,386	5.0	J	196	47,582	63.9	196	47,148

Gold has been valued at 249s. 1d. per oz. fine. (April 248s. 6d.). L indicates loss. † Working Profit. * Working Profit includes sundry revenue. Table excludes profits from Uranium, Pyrite and Acid, and also production from Uranium divisions at Luipaards Vlei, Randfontein and W. Rand Consolidated.

ESTIMATED URANIUM REVENUE

Company	Year ends	May Profit (£000)	This year (cum.) (£000)	Last year (cum.) (£000)	Company	Year ends	May Profit (£000)	This year (cum.) (£000)	Last year (cum.) (£000)
Gold Fields					J.C.I.				
Doornfontein	J	13.0	159.0	218.0	E. Champ d'Or (b)	D	7.0*	33.0*	30.2*
Luipaards Vlei (a)	J	55.0	957.0	970.0	Freddies Cons.	D	35.0*	168.0*	134.0*
Vogels	D	52.0	256.0	263.0	Govt. G.M.A.	D	22.1*	110.3*	119.0*
West Drie	J	50.0	515.0	479.5	Randfontein (a)	D	105.0*	532.5*	551.0*
Anglo American					General Mining				
Daggas	D	134.1	693.6	686.0	Buffelsfontein	J	217.0	2216.0	1530.0
President Brand	S	45.2	368.2	351.0	Ellaton	D	15.0	92.0	82.0
President Steyn	S	58.9	480.9	457.0	Stillfontein	D	86.0	438.0	448.0
Vaal Reefs	D	144.6	702.4	617.0	W. Rand Cons. (a)	D	198.8	998.4	1172.7
Welkom	S	56.4	455.4	428.0	Anglo Transvaal				
West. Reefs Ex.	D	158.6	789.0	769.0	Hartebeestfontein	J	270.0	2848.6	2725.3
Central Mining					Lorraine	S	34.0	274.0	246.0
Blyvoor	J	165.9	1701.4	—	N. Klerksdorp	D	11.0	55.0	62.0
Harmony	J	196.4	1716.2	—	Virginia O.F.S.	J	178.7	2016.2	2003.0

Table includes profit from uranium, acid and pyrite before loan redemption. (a) Total profit from uranium section. (b) Overall profit. (c) Figures not available. *Net revenue after provision for loan redemption.

Financial News and Results

Bid for Yukon Consolidated?—A firm of London solicitors, acting on behalf of clients, has approached Yukon Consolidated Gold Corporation with a tentative offer of 8s. 6d. per share. The Yukon board has asked for further details. An announcement will be made soon.

Tanjong Cuts Payment.—Tanjong Tin Dredging is paying a fifth interim dividend of 1s. per share on account of 1958. This makes a total of 2s. 9d. for the year, against 6s. 6d. for 1957. The dividend has been cut as a result of a reduction in earnings from £168,846 (after tax of £119,000) to £78,355 (after tax of £47,000). The reserve appropriation is £10,834, against £185,000, and the carry forward is £20,160, compared with £22,796 brought in. Meeting, July 9.

Kinta Earnings Slump.—Earnings of Kinta Tin Mines in 1958 fell to £18,400 from £122,485, both figures after tax. A third and final interim of 6d. per share makes a total of 1s. 3d. for the year, compared with 6s. previously. Meeting, July 9.

Geevor Bid Rejected by Board.—The board of Geevor Tin has advised rejection of Mr. Michael Lewis' proposed offer of 23s. 6d. per stock unit. Upon receipt of the formal offer, the present board will give its reasons for rejection.

Durban Deep not a "Short Life" Mine.—Any attempt at an accurate assessment of the remaining life of Durban Deep could easily be invalidated by changing conditions, but the mine does not fall into the short life category. This was stated by Mr. T. Reekie, chairman, in answer to a question at the company's annual meeting.

Minerals Separation Earns More.—Profits of the Minerals Separation group in 1958 reached a new high record of £818,000 compared with £740,000 in 1957. Taxed attributable profits were £327,000 against £298,000. The dividend rate is unchanged at 1s. 6d. on the higher capital. The chairman, Mr. J. N. Buchanan, says that the company proposes to issue a further 3,600,000 stock units, of which 600,000 will be offered at 15s. by way of rights in the proportion of 3-for-22, while the remainder will be absorbed in a 3-for-5 scrip issue. During the year, Minerals Separation increased its investment in Chartered, and maintained its holdings in Nchanga, Mufulira and Rhokana. Meeting, July 1.

A.M.E.M.E. CONVENTION

The Association of Mining, Electrical and Mechanical Engineers met for their annual convention last week at Newcastle-upon-Tyne for the first time in fifteen years.

On the more serious side of the Convention programme, this year's president, Mr. Ernest Loynes, the N.C.B.'s chief electrical engineer for North-West Division, discussed how to set about training the engineer in general and the rising members of the A.M.E.M.E. in particular.

The Thornton Memorial Lecture, extracts from which we hope to publish next week, was delivered by Mr. H. T. Ramsay, director of the Safety in Mines Research Establishment.

STILFONTEIN GOLD MINING COMPANY LIMITED

(Incorporated in the Union of South Africa)

Mr. J. Scott, Chairman of the Company, presided at the 10th Annual General Meeting of Stilfontein Gold Mining Company Limited, held at 6 Holland Street, Johannesburg, on June 2, 1959, and addressed the Meeting as follows:

The reports of the Directors and the Consulting Engineers, together with the accounts for the year ended December 31, 1958, which you have before you reflect the progress made on the mine during that period.

The Working Profits for the year increased from £4,694,075 to £5,883,425. This was due to a rise in the average monthly milling rate from 102,500 to 116,500 tons, and to the increased surface waste sorting which followed the commissioning of the Reef Picking Plant in August. The average monthly sorting rate increased from 30 per cent to 34 per cent, and the Gold and Uranium recovery grades were higher at 9.995 dwt. per ton and 0.304 lb. per ton respectively as compared with 9.173 dwt. per ton and 0.289 lb. per ton in the previous year. The average Working Costs were higher by 2s. 8d. per ton milled, due mainly to the higher sorting rate.

Development footage increased during the year to 69,152 feet compared with 61,011 feet in 1957. Payability was lower at 79.6 per cent, but the average payable values of both Gold and Uranium were higher at 482 in./dwt. and 13.87 in./lb. respectively, as compared with 436 in./dwt. and 13.16 in./lb. respectively for the previous year.

There was an increase of 210,000 tons in the ore reserves, which at the year-end totalled 4,571,000 tons at an average value of 10.07 dwt. per ton for Gold and 0.317 lb. per ton of Uranium over an estimated average stoping width of 40.1 inches.

The latest extension of the Reduction Plant to a rated capacity of 160,000 tons per month, was commissioned in July, 1958. The Margaret Shaft was sunk to its final depth of 4,444 feet and it and the Koepe Winder were commissioned at the year-end.

The overall nett profit for the year under review was £5,961,975 which, when added to the undistributed balance of £670,038 brought forward from the previous financial year, made £6,632,013 available for appropriation. The sum of £3,344,984 was appropriated for capital expenditure, £570,294 in reduction of the Uranium and Acid Loans and £2,449,298 equivalent to 3s. 9d. per share, for distribution to shareholders in dividends. The balance of £267,437 was carried forward to the current financial year, towards the end of which the Company will, for the first time, be assessable for Income Tax.

Towards the end of last year, following the completion of the Margaret Shaft and the commissioning of the Koepe Winder, the greater part of the development was concentrated in the deeper levels between the Charles and Margaret Shafts and unexpectedly encountered a zone of low payability. As a result the percentage payability of the whole mine dropped to 51.9 per cent for the March quarter, the lowest in its history. Of the development done in this region between 12 and 14 levels up to the end of April of this year, 6,555 feet were on reef and

sampled; 32.3 per cent proved payable at an average value of 262 in./dwt. for Gold.

In order to traverse this zone as quickly as possible, the development target has been stepped up from 7,000 to 9,000 feet per month and I am pleased to say that to the west and east there are already encouraging signs of improvement both in values and percentage payability.

During the current quarter a down-throw fault has been encountered in 13 and 14 haulages West, as a result of which these haulages have been continued on reef. To date, 400 feet have been developed of which 100 per cent proved payable at an average value of 341 in./dwt.

To the east, vertical boreholes drilled from the face positions of 12, 13 and 14 haulages disclosed values of 276, 780 and 1,335 in./dwt. respectively.

These results are encouraging and indicate that the poor zone seems to be limited to a strike length of not more than 4,000 feet on these levels.

Soon after the issue of the March Quarterly Report, there were indications underground that the western limit of the zone of low payability had been reached. Therefore it was decided not to issue a Chairman's Statement prior to the holding of this meeting, but to defer the full report until today and so give shareholders the latest available information. Otherwise a wrong impression might have been given by a premature Statement.

I must point out, however, that in order to complete raises already begun, the greater part of the development during the current quarter is still concentrated in this low payability zone and the development results for the June quarter will again be lower than average. Ore drawn from this source also will for some time dilute the richer ore drawn from the other parts of the mine and lower the grade of ore milled.

To offset this as far as possible it will be necessary to hoist and mill a greater tonnage of rock and immediate and vigorous measures are being taken to that end.

To relieve the consequent strain on the hoisting capacities of the Charles and Margaret Shafts, a start has already been made with the sinking of a small 14-foot diameter ventilation shaft originally planned for 1960. This shaft (to be called the James Shaft) will be sunk to a depth of 1,400 feet and will be equipped to serve the area north-east of the Charles Shaft with men and material until such time as it is required for ventilation purposes. Also, the capacity of the Reduction Plant is being increased by a further 16,000 tons per month. Both of these items, which formed part of the future Capital Programme, have been brought forward to the current year.

In view of rumours which have been circulating here and in London, it is necessary to refer to an increase in the amount of water being made by the mine. Since the end of last year, the water pumped has risen from an average of 2½ million gallons per day to 4½ million gallons per day. The installed pumping capacity of the mine, at present 10 million gallons per day, is being increased to its planned capacity of 12½ million gallons per day during this year, which should be more than adequate. Steps are being taken to seal off various fissures above the reef in the upper levels which it is expected will substantially

lessen the quantity of water entering the mine from this source. In addition, to improve the pumping efficiency, additional underground storage and settling sumps are being cut.

The accelerated development proposed and increased pumping rate will of necessity affect Working Costs, while the extension of the mill and the improvement of the pumping facilities, together with the sinking of the James Shaft and the other items to which I referred at the last Annual General Meeting will involve capital expenditure of £2,900,000 for the current year, an increase of £900,000 over my estimate at that time.

Finally, on behalf of the Board and myself, I wish to thank the Consulting Engineers, the Manager of the mine and their respective staffs and the Head Office Secretaries, here and in London, for their efficient and loyal services during the year.

This concludes my review of the affairs of the Company.

BURMA MINES LIMITED

reports that the operations of
BURMA CORPORATION (1951) LIMITED

for the Quarter ended March 31, 1959, resulted in an estimated **Net Profit of K.5,56,300 (£41,723)** making the aggregate estimated **Net Profit for the Nine months** to that date **K.14,80,400 (£111,030)**.

Details of Revenue, Expenditure, Ore Extraction and Production may be obtained from Central Registration Limited, 9 Basinghall Street, London, E.C.2, upon application.

NORWEGIAN COMPANY

seeks capital investment to enable industrial utilization of deposits containing pyrites, quartz, graphite, copper and leadglance, which they own in Northern Norway. Further details can be obtained from Box 637, *The Mining Journal* Ltd., 15 Wilson Street, London, E.C.2.

DAVIES INVESTMENTS LTD.

Bankers, still offer 7½ per cent on sums £20 to £500 (withdrawal on demand) with extra ½ per cent on each £500 unit. Details from Investment Dept. MN, Davies Investments Ltd., Danes Inn House, 265 Strand, London, W.C.2.

"PROTO" No. 2 Mark IV, 2-hour self-contained breathing apparatus sets, unused, brand new condition, complete with instruction booklet, packed in strong pressed steel carrying cases; recent Ministry release, offered at special bargain price of £25 10s. each. Woodfield and Turner Ltd., Cannon Street, Burnley. Telephone 78134.

EASTERN RAND EXTENSIONS LIMITED

(Incorporated in the Union of South Africa)

Mr. J. Scott, Chairman of the Company, presided at the 25th Annual General Meeting of Eastern Rand Extensions Limited, held at 6 Holland Street, Johannesburg, on June 2, 1959, and addressed the Meeting as follows:

While the assets of the Company have changed very little during the year, there was a significant increase in net revenue. Over 90 per cent of our quoted investments continues to consist of holdings in the Stilfontein, Hartebeestfontein, Buffelsfontein and New Pioneer Companies. The progress of these Companies has been reflected in their improved dividend declarations, which have had the effect of increasing the gross revenue of this Company from £100,675 to £146,489 and net revenue from £89,783 to £132,347. The bulk of this increase was passed on to shareholders in two half-yearly dividends totalling £105,000, as compared with a single distribution of £75,000 in the previous year. The allocation to General Reserve has been increased by approximately £5,000 to £25,000, thus raising the total of Investment and General Reserves to £325,000. No shares were sold during the year and the small increase of £270 to a total book value of £543,908 is accounted for by the exercise of certain subscription rights arising from existing shareholdings in the portfolio. The market value of the investments at December 31, 1958, was £1,791,580, an improvement of £264,123 over last year. 13,000 Preference Shares of £1 each in Dagbreekpers Beperk were redeemed during the year.

At balance sheet date, current liabilities, including provision for the dividend paid in February, exceeded current assets by £4,443, which reflects an improvement in the liquid position of approximately £40,000 over the previous year.

Since 1946 the Company has held a 50 per cent interest in the mineral rights of the farms Video 305 and Vermeulenskraal Noord 480 in the Ventersburg district O.F.S. Lydenburg Platinum Limited and General Mining and Finance Corporation Limited each have a 25 per cent interest in these farms. The two farms total 2,729 morgen in extent and their northern and eastern boundaries adjoin the mining lease areas of President Steyn Gold Mining Company Limited and Harmony Gold Mining Company Limited. During the period from 1944 to 1948 three holes were drilled on these properties. The Basal Reef was intersected in V.K.3 at 3,939 feet and assayed 8.9 dwt. over a corrected width of 12.4 inches and in a deflection it assayed 6.7 dwt. over 12.2 inches. Basal reef was not intersected in Boreholes V.K.1 and V.K.2. In view of the results since obtained in the President Steyn and Harmony lease areas, we feel that further drilling should be undertaken to investigate the economic potentialities of the Basal reef on the two farms. Two holes have been started, both on Video. Borehole V.1 is sited 2,000 feet west of the common Harmony boundary and approximately 4,200 feet south of the President Steyn boundary, and on Friday morning had reached a depth of 1,450 feet. Borehole V.2 is situated on the common boundary of Video and Vermeulenskraal Noord approximately 3,000 feet west of the Har-

mony boundary. Drilling of this hole started yesterday.

We continued to hold certain land and buildings in Kroonstad, a 50 per cent interest in 19 morgen of unimproved ground in Boksburg and our 5½ per cent interest in the portion of the original Lucas Block not included in existing mining lease areas. We are still participating in prospecting an area lying to the east of the Lucas Block. Neither of these interests call for particular comment at the moment.

This concludes my review of the Company's affairs.

SOUTHERN VAN RYN REEF GOLD MINING COMPANY, LIMITED

(Incorporated in the Union of South Africa)

Mr. J. Scott, Chairman of the Company, presided at the 43rd Annual General Meeting of Southern Van Ryn Reef Gold Mining Company Limited, held at 6 Holland Street, Johannesburg, on June 2, 1959, and addressed the Meeting as follows:

The dividend income of the Company, which has grown over recent years as its various investments in the Lucas Block area reached the dividend earning stage, has, during the year under review, increased by very nearly 50 per cent as compared with the 1957 level, the relative figures being £104,647 and £154,774. No investments were realized during the year. Expenses remain almost unchanged and the net income increased by £27,564 to a figure of £137,608 for the year. The dividend declared for the year was 7d. per share, equivalent to 29.16 per cent, as compared with 5d. in 1957. This distribution absorbed £119,583 and the transfer to General Reserve of £20,000 left a balance of £12,455 undistributed profits to be carried forward.

At the date of the balance sheet, the book value of the investments at £557,403, was substantially unchanged. The market value of quoted securities, however, improved during the year by over £300,000. This, of course, is due to the higher market prices of the various Lucas Block mining and finance companies, which represent more than 90 per cent of our quoted securities.

Current liabilities, consisting mainly of the dividend declared in December, 1958, amounted to £128,682 and current assets to £111,312, an improvement in the net position of approximately £17,000 since the last published accounts.

Your Company retains its 5½ per cent interest in the balance of mineral rights of the Lucas Block not included in mining lease areas and continues to hold a small participation in certain prospecting which is in progress immediately to the east of the Lucas Block.

Since the year-end there have been no changes in the nature of the Company's activities or in its shareholdings, and a summarized statement of the position of its affairs as at May 29, 1959, is as follows:

Quoted Securities:

Book Value, £556,813.

Market Value, £2,020,631.

Excess of Liabilities over Cash Assets, £23,807.

Sundry Assets, £2,976.

Accepting the market value of quoted shares and taking other assets at book value, the net equity of the Company may be valued at £1,999,800 as against the present Issued Capital of £410,000 in 4,100,000 shares of 2s. each.

For several years the Company has been going through a period of consolidation and has undertaken no fresh activities. Also, subject to minor realizations dictated by financial considerations, its portfolio of quoted shares has remained practically unchanged. The Company and its shareholders have benefited substantially from the progress of the Lucas Block Companies, and at this stage your directors are following a policy of suitably investing a portion of the profits made by the Company which are available after paying dividends.

This concludes my review of the Company's affairs.

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Dorr Oliver Rake Classifier, trough 11 ft. 9 in. long x 2 ft. 6 in. wide x 14 in. deep at feed and constructed ¾ in. m.s. plate. Supported on 4 in. dia. tubular steel stand 5 ft. 8 in. high at feed end and 2 ft. 5 in. high at discharge. Rake blades 12 in. wide x 2½ in. deep at 4 in. intervals, 3 in. x 1½ in. m.s. channels.

Dorr Oliver Rotary Vacuum Filter, drum 3 ft. dia. x 2 ft. face with calve head, trough and slurry agitating gear. Edwards Rotary Vacuum Pump with 2½ in. suction and delivery, two 1 ft. 4 in. dia. x 3 ft. long m.s. receivers.

Mild steel Dewatering Cone, 7 ft. 6 in. dia. at top x 6 ft. 6 in. deep on slope, constructed ¾ in. plate with 1½ in. bottom run-off.

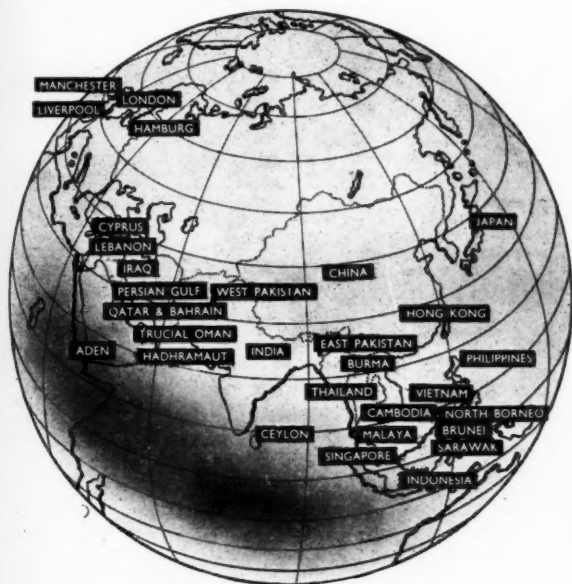
Two: Four-compartment Hartz Jigs by Fraser and Chalmers, each compartment 18 in. sq. x 16 in. deep on straight with 18 in. cone. Supported on 2 in. r.s. angle framework.

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SIR ARCHIBALD FORBES' STATEMENT

The Annual General Meeting of The Central Mining & Investment Corporation Limited will be held on July 20 in London.

The following is an extract from the statement by the Chairman, **Sir Archibald Forbes, G.B.E.**, which has been circulated with the report and accounts:

The profit for the year was £2,131,000 out of which the provision for taxation absorbs £850,000 leaving £1,281,000 for disposal. It is proposed that the final dividend on the Ordinary Shares should be 3/3d. per share which with the interim dividend of 1/6d. would make the total payment for the year 4/9d. per share as compared with 4/-d. for 1957-8. If this is approved the total distribution (after deduction of Income Tax) in Preference and Ordinary dividends will amount to £605,000 leaving £676,000 retained in the business out of the net earnings of the year.

The retention of £676,000 referred to above includes £200,000 transferred to Investment Reserve as a provision for replacement of wasting assets and for exploration. It is the practice of most gold mining companies (as distinct from mining finance houses) to distribute the whole of their available earnings without making allowance for amortization of the mine. Consequently the dividends from these mining companies include, in effect, an element of return of the capital originally invested in the mine. It is therefore prudent—and in my opinion essential—to earmark a portion of the revenue from these sources towards the ultimate replacement of the assets in question through exploration for new mines or otherwise. The amount to be provided in this respect will be kept under review from year to year.

As regards the sale of our interest in the Trinidad Oil Co. Ltd. you are aware that we have always regarded the surplus arising therefrom as a capital accretion although it is in effect taxed on a deferred basis. We therefore consider that the right policy in the accounts is to take direct to reserves any net book credits arising to Central Mining Finance Ltd. from sales of investments to the extent that these credits result from the reorganization of the Group effected in the period to March 31, 1957, and previously explained to shareholders.

From the consolidated Balance Sheet you will see that the surplus of current assets over current liabilities and provisions is broadly the same as at the close of the previous year. Nevertheless some changes have taken place within these net totals. Our cash balances and holdings of Government Stocks have been significantly reduced. This is due to a reduction in balances held on behalf of associated companies, to an increase in loans made by us and to an increase in our investments and other interests.

It is noted in the Accounts that the investment portfolio at March 31, 1959 (excluding Gilt-Edged holdings and loans) had an approximate valuation,

subject to the qualifications there stated, of over £22m. This in geographical terms is broadly distributed as to 74% in South Africa and Rhodesia, 6% in Canada and the U.S.A. and 20% in the United Kingdom and elsewhere. Apart from undertaking our share in the financing of the companies and ventures embraced in the Central Mining/Rand Mines Group we are continually examining propositions for investment in other directions in various parts of the world including the United Kingdom. The increase of nearly £5m. in this valuation as compared to that a year ago while in part due to additional net investment has in greater measure resulted from the overall advance in the market values of quoted securities, particularly those of gold mining companies.

South African Gold Mining Industry

The vigour and enterprise of the South African gold mining industry are amply illustrated by the fact that during the last seven years, no less than eighteen new mines have started producing gold in the Transvaal and Orange Free State and these are now responsible for some 47% of the Union's total output. From the beginning of 1952 to the end of 1958, these new companies produced gold worth £344 million against a capital outlay of approximately £270 million. During the same period dividends totalling £58 million were paid and South African tax and lease charges, which were greatly eased by the amortization provisions of Union law governing taxation of mines, amounted to £12 million. Taxation will increase substantially each year from now on, as the "tax holiday" enjoyed by each mining company draws to an end, but profits should also increase as the mines reach their planned optimum scale of operations in both tonnage and grade.

The average cost per ounce of gold produced by these eighteen mines during 1958 emerged at the remarkably low figure of 134/6d. Modern mining methods and layout, the large scale of operations and the high grade of ore milled have contributed to this achievement. Costs at the Central Mining/Rand Mines Group mines range from 108/-d. an ounce at Blyvooruitzicht to 247/3d. at Modderfontein East.

General

The Directors are happy to be able to recommend the increase in dividend mentioned above. As to the prospects for the current year I am hopeful that the revenue from dividends and interest will be at least maintained. It is, however, more difficult to predict the outcome of share dealing operations and we cannot count upon a continuance of the favourable conditions of 1958/59. This is particularly pertinent in relation to one of our functions in the Central Mining/Rand Mines Group—to help to keep a reasonably free market in the shares of Group companies.

BRITISH-BORNEO PETROLEUM SYNDICATE

RECORD TOTAL REVENUE

The 45th Annual General Meeting of British-Borneo Petroleum Syndicate Limited was held on June 10 in London.

Mr. Campbell L. Nelson, the Chairman, presided, and, in the course of his speech, said:

The Balance Sheet shows that our capital and reserves amount to £1,136,000, which are represented by our oil interests and investments and by our Net Current Assets.

Oil interests and investments stand in the Balance Sheet at or under cost. The quoted investments at £792,000 had a Stock Exchange value at March 31 of £1,906,000. The gratifying surplus that exists is one of the rewards of the Board's policy over the years of retaining a sizeable part of each year's profit and investing it largely in growth stocks, mainly oil and mining companies. Total revenue at £394,000 is a record for the Company. The net profit for the year is £197,000.

The principal contribution to our revenue continues to be made by the royalty from oil production in Brunei. In a recent report by the Director of the Geological Survey Department in the British Territories of Borneo, the reserves of oil in British Borneo are given as at least 300,000,000 barrels—almost entirely concentrated in the Seria Field. We may expect, therefore, that the royalty will remain substantial.

Apex (Trinidad) Oilfields, in which we have a substantial investment, continues its successful record. Ultramar Company, in which we have a moderate investment, had a satisfactory year.

The greater part of our investments lies in the Oil Industry. The tremendous increase in world oil-productive capacity has caused stresses and strains in the Industry. My own view is that these difficulties will be of a short-term nature and that in the long term the growth of the Industry will become more evenly balanced. The massive capital expenditure programmes of the leading oil companies are evidence of the confidence which exists for the future of the Industry.

Our policy of dividing our profits between increased distributions to stockholders and investing largely in growth stocks has enabled us over the years to build up the Company to its present position. Now in addition to our valuable Royalty Rights we have a portfolio of sound and progressive investments and a strong financial position for dealing with future business. It is equally satisfactory that this is the tenth year in succession in which we have been able to increase the distribution to stockholders. Further, during that period the share capital will have been raised from £250,000 to £450,000 by the distribution of fully-paid shares to our Members with the result that a Member will now hold nine shares for every five shares which he held in 1951. Members will, I think, agree that both the result for the year and the general position of the Company are most satisfactory.

The report and accounts were unanimously adopted and the total distribution of 1s. 9d. tax-free was approved.

The proposed increase of capital, capitalization of reserves and scrip issue of one 6s. unit of stock for each eight 6s. units of stock held were sanctioned.

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